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Joint Program Executive Office for Chemical and Biological Defense

Joint Project Manager, Radiological & Nuclear Defense (JPM-RND) Joint Enterprise Research, Development, Acquisition and Procurement Omnibus Contact (JE-RDAP)

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Distribution Statement A: Approved for public release; distribution is unlimited.

JPM-RND Mission, Vision, & Funding

Mission: The Joint Project Manager for Radiological and Nuclear Defense is responsible for research, development, acquisition, fielding and life-cycle support of joint radiological and nuclear defense systems supporting the National Military Strategy.

Vision: Collaboratively develop and deliver Radiological and Nuclear Defense capabilities to support our warfighters, our nation, and our allies.

Joint Funding: Office of the Asst. Secretary Defense (Nuclear Chemical Biological) Nuclear Matters funds RDT&E and a small amount of Procurement Services' POMs augment the joint procurement to cover the majority of the total system requirement.

Army-specific programs (i.e.Man-portable Radiological Detection System): Army G8

JPM-RND Objectives and Future Funded Programs

JPM RND Objectives

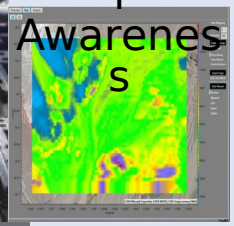
- **Upgrade & Modernize capabilities**
- **Data transmission to provide Situational Awareness (SA) & enable reach-back**
- **Inform future programs through ATDs**
  - **Speeds up development**
  - **Reduces acquisition risks**

FUTURE FUNDED PROGRAMS

Backpack Detector

HPGe

Situational Awareness



Man-portable Radiological Detection System

- FY17 Start
- FY18 Contracting
- CPD approved by AROC

Medium Res 1-3%

Low Res > 3%

Palm-sized

RIID Family of Systems

- FY18 Start
- FY19 Contracting
- One variant at a time
- CDD to be developed

Vehicle Ship Aerial Installation

Platform Mounted Detection Systems

- FY21 Start
- FY22 Contracting
- One variant at a time
- CDD to be developed

PHOTOS FOR ILLUSTRATION PURPOSES ONLY

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Man-portable Radiological Detection System (MRDS)

Man-portable Radiological Detection System

- **System of Systems with three elements: Detection, Communications, and Situational Awareness to:**
  - **Counter Nuclear Threats: provides capability for DoD to rapidly search during Sensitive Site Assessments and definitively find SNM and weapons during Sensitive Site Exploitation missions; supports interdiction of known or suspect areas for radioactive devices, SNM or weapons**
- **Support NTNF collection with isotope detection**
- **System includes:**
  - **Man-portable backpack: 10-15 meter standoff gamma/neutron detection to provide rapid presumptive ID**
  - **High resolution RIID (HPGe gamma) to provide field confirmation of SNM**
  - **SA software to monitor mission progress, analyze detection data to develop information to send to HQ**

*Army Funded with FY17 Program Start and Contract Efforts in FY

USERS: Army, SOCOM, Air Force, DNDO, International

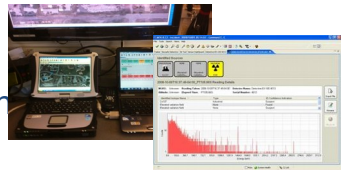
Man-Portable Radiological Detection System (MRDS)

Mission:
- Provide networked, improved RN detection, localization, and presumptive and field-confirmatory identification capabilities in near-real-time to enhance tactical level situational awareness.

Detection/Identification
- Hands-Free Detector (Backpack): Detects neutron and gamma and presumptively identify SNM.
- High Resolution RIID: Allows field-confirmation of SNM.

High Res RIID

- **Situational Awareness Tools**
  - Laptops & Mobile Field Kit – CBRN Software:
    - COTS laptops with Gov't owned software DTRA & Asynchrony developed from EOD software
    - Can remotely monitor and track sensors; draw feature to indicate areas of interest inside the facility; and a chat feature to keep teams and command post informed



- **Communications**
  - GOTS radios provide C2
  - Used as "breadcrumbs" to retransmit from inside facilities with 1' thick, solid, poured concrete walls

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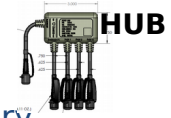
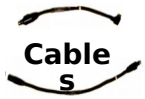
- **Miscellaneous**
  - NET Warrior – Hub, Cables, End User Device, Conformal Battery
  - Transportation Cases



HUB



Cables

End User Device

Conformal Battery

Man-Portable Radiological Detection System (MRDS)

Description / Capabilities:

- Hands-free sensors used to provide 10-15m standoff to conduct rapid area assessments of facilities and presumptive identification of Special Nuclear Materials (SNM)
- Hand-held sensors used to confirm or deny the presence of SNM
- Radios provide command and control and enable voice and data retransmission from inside facilities with thick concrete walls
- A Situational Awareness (SA) Tool on eight laptop computers supports near-real-time remote sensor monitoring and tracking, allows an initial entry team to identify areas for exploitation, and provides a chat feature to update mission progress

Hands-Free Sensor

Hand-Held Sensor

Capability Improvements over the JCTD System:

- Detectors are lighter and more sensitive
- GOTS radios ensure interoperability within the Service
- SA Tool software transitions to JPM RND for continuous improvement & integration onto tactical networks
- Transition to POR provides logistics and sustainment

ogram Start in FY17 with contracting effort to begin in FY18

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RIID Family of Systems

MINI RIID

- Cell phone size low resolution RIID designed to provide low cost presumptive ID of Isotopes for forces who have a probability of encountering radiological materials during their mission
- Networkable: allows sending of spectrum to higher headquarters so that the location can be prioritized and added to target list of potential sensitive sites requiring exploitation
- Leverages development off of DARPA Sigma project that is procuring 10,000 @ approx. $400 ea.; project finishes in FY17

Low Resolution RIID

- Modernization of service's current Sodium Iodide (NaI) RIIDs; many purchased after 9-11 with O&M and no sustainment (repair parts, maintenance contract or calibration, etc.)
- Networkable: To be determined based on requirements established by the RN ICT.
- Potentially leverages off of DHS' Domestic Nuclear Defense Office's procurement of new NaI RIID assuming requirements are comparable.

Medium Resolution RIID

- Improved energy resolution than NaI gamma RIIDs which are 6% to support high confidence presumptive ID to upgrade Dismounted Recon SKO capability
- Available technologies/energy resolution: LaBr (3% gamma), CLYC (4% for Gamma & neutron), CZT (1-1.5% gamma)
- Networkable: enables sending of spectrum to higher headquarters after assessment of sensitive sites and

Directional RIID

- May require modification of DNDO COTS solution to meet possible militarization & networking requirements
- Provides indication of direction of location of the isotopes of interest in addition to medium resolution presumptive identification capability either through visualization on tablet or direction arrow on sensor
- Available technologies: CZT or HPGe (0.5% gamma)
- Networkable: enables directionality to be sent to higher headquarters or to characterization team to support exploitation operations

Emerging Requirements for ARND FOS

DESCRIPTION

Advanced Radiological Nuclear Detection Family of Systems (ARND FoS) – Leverages commercial-off-the-shelf aircraft-mounted and vehicle-mounted gamma and neutron detection technologies used in the Smart Threads Integrated Radiological Sensors (STIRS) Joint Capability Technology Demonstration (JCTD) to provide technical forces with wide area detection search/find capabilities.

- **Anticipated Program Start FY19 based on availability of funding**

Aerial Radiation Detection Identification and Mapping System (ARDIMS)

- **Transportable aerial systems are highly specialized.**
- **The ARDIMS consists of two mountable pod versions for use with manned and unmanned helicopters.**
- **The pods are flight certified, waterproof, and high-shock designs including a spectroscopic gamma / neutron gross counting pod pods.**
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Vehicle Mounted Detection System (VMDS)

- **Available in mobile, transportable, and custom configurations**
- **Gamma and neutron sensitivity**
- **Dual mode: mobile or stationary**
- **GPS enabled**
- **Water resistant**
- **Mobile mode operates at speeds up to 20 mph (32 kph)**
- **Isotope ID**
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Platform Mounted Radiac – (Vehicular Radiation Point Detector) (VRPD)

- Mission: Rugged networkable point detector that is man-wearable and can be integrated onto vehicles, ships and fixed sites to provide warning and situational awareness for crews and personnel and support mounted RN recon. Wide operating range of detection to include low level, prompt neutron/gamma detection. Replaces Army's analog non-networked UDR-13/14. Provides warning of detected radiological hazards, turn-back dose and Operational Exposure Guidance (OEG) to enable personnel to take protective measures until they can depart the area. Designed to meet mission critical platform radiological survivability requirements.
- Program Objective: Modified COTS for uses on various manned/unmanned, ground/air/sea platforms, fixed sites; and man-wearable
- Potential Application: USA, USMC, USAF, SOCOM, USCG platforms
- FY20 start in FY17-21 POM as placeholder – Depending upon decisions by community other variant may be selected for development and procurement first

Vehicular Mounted Used As Example – Type of Platform TBD BY ICT – Anticipate Multiple Variants

Examples only

Exact Form Fit
and function
TBD

RN Sense Vision

Current

Mid-Term

Far-

Detection

STAND ALONE DETECTORS

SINGLE DETECTOR FOR ALL SERVICES

SEARCH FOR THREAT SOURCES

FORENSICS

TAG, TRACK, AND LOCATE

BUILT IN SENSOR TECHNOLOGY

IMAGING

STANDOFF DETECTION FOR THREAT SOURCES

FORENSICS AUTONOMOUS ROBOTICS

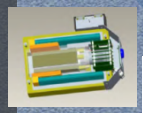
Navy

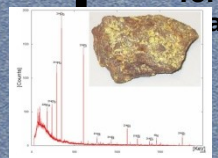
Air Force

Army

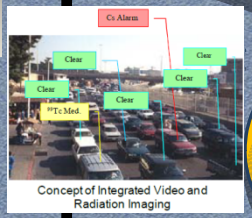
Single RADIAC for DOD

Search for Threat source





Isotope Identification



Concept of Integrated Video and Radiation Imaging

Self Detecting Materials

Immediate Threat Detection

INFORMATION DEVELOPMENT
Connections or visualization to provide insight

ACTIONABLE INTELLIGENCE
Intentions or actions

Machine language or single sensor information

Multi-sensor *analysis*

Ensemble and Material Integrated Sensors

PDR-75A

PDR-75

OCCUPATIONAL AND BATTLEFIELD DOSIMETRY

SELF DETECTING TECHNOLOGIES

REALTIME INETEGRATED DOSIMETRY

Dosimetry

BATTLEFIELD DOSIMETRY

LOW-LEVEL DOSIMETRY

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